AMENDMENTS TO THE CLAIMS:

This listing of claims will replace all prior versions and listings of claims in the application:

1. (Currently Amended) An image processing apparatus for processing input image data and for outputting output image data, the image processing apparatus comprising:

an edge detection unit for detecting, for pixels of the input image data, an edge gradient direction with the largest gradient of pixel values and an edge direction orthogonal to the edge gradient direction ~~for each pixel of the input image data~~, setting a number of sampling points on a line in the edge direction, and generating sampling pixel values for the sampling points by interpolation;

an eigenvalue and eigenvector detection unit for detecting eigenvalues for the edge direction and the edge gradient direction, and calculating a reliability ratio of an edge in the edge direction with the eigenvalues;

an edge direction processing unit for ~~performing smoothing processing on~~ smoothing the input image data in the edge direction ~~for each pixel~~, including the sampling pixel values, by filtering the pixel values, ~~of the output image data in accordance with a detection result of the edge detection unit~~ and ~~for sequentially~~ outputting smoothed pixel values ~~corresponding to respective pixels of the output image data~~; and

an edge gradient direction processing unit for ~~performing edge enhancement processing~~ enhancing the input image data in the edge gradient direction ~~on the pixel values output from the edge direction processing unit for the respective pixels of the output image data in accordance with the detection result of the edge detection unit~~ and for ~~sequentially~~ outputting enhanced pixel values ~~of the output image data~~;

wherein the edge direction processing unit calculates a filtering range by multiplying the reliability ratio by an eigenvalue of the edge gradient direction, and changes a number of taps for the filtering based on the calculated filtering range.

2-3. (Canceled)

4. (Currently Amended) The image processing apparatus according to Claim [[3]] 1, wherein the ~~changing of the~~ number of taps for the filtering ~~processing performed by the edge direction processing unit~~ is ~~changing of the number of taps~~ changed in a decimal fractional part by changing a weighting coefficient ~~in accordance with~~ based on the reliability ratio, ~~of the edge in the edge direction~~ and by performing weighting addition of filtering ~~processing~~ results of different numbers of taps using the weighting coefficient.

5. (Currently Amended) The image processing apparatus according to Claim [[3]] 1, wherein the reliability ~~of the edge in the edge direction~~ ratio is a ratio of a dispersion of the gradient of the pixel values in the edge direction to a dispersion of the gradient of the pixel values in the edge gradient direction.

6. (Currently Amended) The image processing apparatus according to Claim 1, wherein ~~after generating interpolated image data in the edge gradient direction based on interpolation processing for the image data based on the respective pixel values output from the edge direction processing unit on a line extending in the edge gradient direction for the respective pixels of the output image data in accordance with the detection result of the edge detection unit,~~ the edge gradient direction processing unit sets a number of gradient sampling points on a line in the edge gradient direction, generates gradient sampling pixel values for the gradient sampling points by interpolation, and ~~sequentially outputs the pixel values of the output image data by performing filtering processing~~ performs filtering on the ~~interpolated image data in the edge gradient direction~~ gradient sampling pixel values.

7. (Currently Amended) The image processing apparatus according to Claim 1,

wherein the output image data is image data obtained by changing a sampling pitch of the input image data, and

wherein the image processing apparatus further includes:

an interpolation processing unit for performing ~~an~~ interpolation ~~operation~~ on the input image data and for outputting interpolated image data with a sampling pitch of the output image data;

a blend ratio determination unit for changing a weighting coefficient for blending ~~in accordance with a reliability~~ based on the reliability ratio ~~of an edge in the edge direction~~; and

a blend processing unit for performing weighting addition of the image data output from the edge gradient direction processing unit and the interpolated image data using the weighting coefficient for blending, and for outputting the output image data.

8. (Currently Amended) The image processing apparatus according to Claim 1, further comprising:

a blend ratio determination unit for changing a weighting coefficient for blending ~~in accordance with a reliability~~ based on the reliability ratio of an edge in the edge direction; and

a blend processing unit for performing weighting addition of the ~~image data output from the edge gradient direction processing unit~~ enhanced pixel values and the input image data using the weighting coefficient for blending, and for outputting the output image data.

9. (Currently Amended) An image processing method for processing input image data and for outputting output image data, the image processing method comprising:

~~an edge detection step of~~ detecting, for pixels of the input image data, an edge gradient direction with the largest gradient of pixel values and an edge direction orthogonal to the edge gradient direction for ~~each pixel of the input image data~~;

setting a number of sampling points on a line in the edge direction;

generating sampling pixel values for the sampling points by interpolation;

detecting eigenvalues for the edge direction and the edge gradient direction, and calculating a reliability ratio of an edge in the edge direction with the eigenvalues;

~~an edge direction processing step of performing~~ smoothing ~~processing on~~ the input image data in the edge direction ~~for each pixel~~, including the sampling pixel values, by filtering the pixel values ~~of the output image data in accordance with a detection result by the edge detection step~~ and ~~sequentially detecting~~ outputting smoothed pixel values; ~~corresponding to respective pixels of the output image data; and~~

~~an edge gradient direction processing step of performing edge enhancement processing in~~ enhancing the input image data in the edge gradient direction ~~on the pixel values detected by the edge direction processing step for the respective pixels of the output image data in accordance with the detection result by the edge detection step~~ and ~~sequentially~~ outputting enhanced pixel values ~~of the output image data~~;

calculating a filtering range by multiplying the reliability ratio by an eigenvalue of the edge gradient direction; and

changing a number of taps for the filtering based on the calculated filtering range.

10. (Canceled)

11. (Currently Amended) A computer-readable recording medium ~~recording thereon~~ storing a program for an image processing method performed by arithmetic processing means for processing input image data and for outputting output image data, the program for the image processing method comprising:

~~an edge detection step of~~ detecting, for pixels of the input image data, an edge gradient direction with the largest gradient of pixel values and an edge direction orthogonal to the edge gradient direction for ~~each pixel of the input image data~~;

setting a number of sampling points on a line in the edge direction;

generating sampling pixel values for the sampling points by interpolation;

detecting eigenvalues for the edge direction and the edge gradient direction, and calculating a reliability ratio of an edge in the edge direction with the eigenvalues;

~~an edge direction processing step of performing~~ smoothing ~~processing on~~ the input image data in the edge direction ~~for each pixel~~, including the sampling pixel values, by filtering the pixel values ~~of the output image data in accordance with a detection result by the edge detection step~~ and ~~sequentially detecting~~ outputting smoothed pixel values; ~~corresponding to respective pixels of the output image data; and~~

~~an edge gradient direction processing step of performing edge enhancement processing in~~ enhancing the input image data in the edge gradient direction ~~on the pixel values detected by the edge direction processing step for the respective pixels of the output image data in accordance with the detection result by the edge detection step~~ and ~~sequentially~~ outputting enhanced pixel values ~~of the output image data~~;

calculating a filtering range by multiplying the reliability ratio by an eigenvalue of the edge gradient direction; and

changing a number of taps for the filtering based on the calculated filtering range.